

Pearson
BTEC Level 3 National

in

Information Technology

Unit 2: Creating Systems to Manage Information



For use with Certificate, Extended Certificate and Foundation Diploma in Information Technology

First teaching from September 2016

Issue 1

**PEARSON** 

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#### Pearson BTEC Level 3 Nationals

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# Information Technology

Unit 2: Creating Systems to Manage Information

Certificate/Extended Certificate/Foundation Diploma
Sample assessment material for first teaching
September 2016



#### Instructions

- This booklet contains material for the completion of the set task under supervised conditions.
- This booklet is specific to each series and this material must only be issued to learners who have been entered to undertake the task on a date set by Pearson in the relevant series.
- This booklet should be kept securely until the start of the 10 hour supervised assessment period.
- This set task should be undertaken during the 1 week assessment period timetabled by Pearson.

#### Information

The total mark for this paper is 66.



Paper reference XXXX/XX S50116A

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# Instructions to Teachers/Tutors and/or Invigilators

This paper must be read in conjunction with the unit information in the unit specification and the BTEC Nationals Information for Conducting External Assessments (ICEA) document. See Pearson website for details.

The set task should be carried out under supervised conditions.

Electronic templates for use in activities 3,4,5 and 6 will be provided for centres to download for candidate use.

Work should be completed on a computer. Internet access is not permitted.

During any break, materials must be kept securely.

All learner work must be completed independently by the Teacher/Tutor and/or Invigilator and authenticated before being submitted to Pearson.

Centres are free to arrange the supervised assessment period how they wish provided the 10 hours for producing final outcomes are under the level of control specified, and in accordance with the conduct procedures.

Refer carefully to the instructions in this task booklet and the Information for Conducting External Assessments (ICEA) document to ensure that the assessment is supervised correctly. An authentication statement will be required confirming that learner work has been completed as directed.

Learners must not bring anything into the supervised environment or take anything out without your knowledge and approval.

Centres are responsible for putting in place appropriate checks to ensure that only permitted material is introduced into the supervised environment.

#### Maintaining security:

- User areas must only be accessible to the individual learner and to named members of staff.
- Learners can only access their work under supervision.
- Internet access is not permitted.
- Learner work is regularly backed up. Learners will save their work to their folder using the naming instructions indicated in each activity.
- Any work learners produce under supervision must be kept secure.
- Any materials being used by learners must be collected in at the end of each session, stored securely and handed back at the beginning of the next session.

#### **Outcomes for Submission**

14 documents will need to be submitted by each learner using the file names listed.

#### Activity 1: activity1erd:

- in their chosen software format and
- o as a PDF.

#### Activity 2: activity2data:

- in their chosen software format and
- o as a PDF.

# Activity 3: activity3interface:

- in their chosen software format and
- o as a PDF.

# Activity 4: activity4test:

- in their chosen software format and
- o as a PDF.

### Activity 5: activity5database and activity5testing:

- in their chosen software format and
- o as a PDF.

#### Activity 6: activity6evaluation:

- in their chosen software format and
- as a PDF.

A fully completed authentication sheet must be completed by each learner; the prepared notes do not need to be submitted with the final outcomes to Pearson.

#### Instructions for Learners

Read the set task information carefully.

This contains all the information you need to complete each activity within the set task.

Plan your time carefully to allow for the preparation and completion of all the activities.

You will complete the activities within the set task under supervision and your work will be kept securely during any breaks taken.

You may use a calculator and will have access to a computer.

Internet access is not allowed.

You must work independently throughout the supervised assessment period and should not share your work with other learners.

Your teacher/tutor may clarify the wording that appears in this task but cannot provide any guidance in completion of the task.

This task must be completed under supervision in timetabled sessions provided by your centre. It is likely that you will be given more than one timetabled session to complete these tasks.

#### **Outcomes for Submission**

You will need to submit 14 documents, using the files names listed, on completion of the supervised assessment period:

#### Activity 1: activity1erd:

- in your chosen software format and
- as a PDF.

#### Activity 2: activity2data:

- in your chosen software format and
- o as a PDF.

#### Activity 3: activity3interface:

- in your chosen software format and
- o as a PDF.

#### Activity 4: activity4test:

- in your chosen software format and
- o as a PDF.

# Activity 5: activity5database and activity5testing:

- in your chosen software format and
- o as a PDE.

# Activity 6: activity6evaluation:

- in your chosen software format and
- o as a PDF.

A fully completed authentication sheet must also be completed.

# Set Task Brief

You are advised to spend 15 minutes reading the assessment task, information, task instructions and the activities you are to complete. You may make notes and/or highlight information to use in the completion of your project documents.

#### Task Scenario

You have been asked to create a database for the cycling road race 'Tour of Norfolk'.

The tour consists of 6 stages, in different locations in Norfolk, that are of varying distance in miles and degree of difficulty:

- Norwich, 22.5 mile time trial.
- King's Lynn, 6.4 mile sprint.
- Thetford, 15.6 mile hill stage.
- Great Yarmouth, 19.8 mile road race.
- Fakenham, 14.9 mile time trial.
- Swaffham, 26.4 mile road race.

Four teams are entered for the race, with four male and four female riders per team.

The four cycling teams are:

- Skie Fliers
- Peers Cyclers
- Kings Cycle Club
- Norfolk Pedallars.

Each rider needs to have the time taken for the completion of each stage recorded in minutes and seconds.

For each stage:

- the time taken for each rider to complete is recorded
- when a rider exceeds the maximum time set, their final time is calculated as the maximum time plus 10 minutes
- when a rider does not complete a stage, their final stage time is set to zero then calculated as the maximum time plus 20 minutes.

#### You need to:

- design a database structure that:
  - includes rider, team and stage data
  - avoids unnecessary duplication of data
  - validates data input to ensure integrity
  - includes one race official, one team and one rider user accounts.
- create a robust database with a suitable user interface for race officials to enter individual rider's completion time for each stage.
- import and manipulate the given data as reports.
- provide database outputs showing:
  - an individual rider's time taken to complete each stage
  - an individual rider's total time to complete all race stages
  - a ranking of riders from the fastest to slowest for each stage and overall
  - a ranking of riders by gender from fastest to slowest for each stage and overall
  - a ranking of riders aged 21 and under from fastest to slowest overall
  - a ranking of riders aged 22 and older from fastest to slowest overall
  - a ranking of the team performance from fastest to slowest overall.
- test your database, adding data to ensure that the database meets all requirements.
- evaluate your database against the given requirements.

#### Information

The provided raw data contains results for the first stage and age at date of race registration. Figure 1 shows an annotated extract of the data.

# Figure 1

Теат	Team manager	Team e-mail	Rider	Rider first name	Rider	Stage	Gender	Stage type	Stage length in miles	Maximum time allowed for stage	Stage date	Stage completion time	Penalty minutes
Skie Flyers	Dave Smith	Skie@hotmail.com	Wiggons	Brad	28	Norwich	M	TimeTrial	22.5	120	04/07/2015	70.05	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Ernie	Symes	56	Norwich	M	TimeTrial	22.5	120	04/07/2015	68.3	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Smith	Winsley	19	Norwich	S	TimeTrial	22.5	120	04/07/2015	7554	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Jarvit	Andrew	50	Norwich	S	Time Trial	22,5	120	04/07/2015	120	82
Skie Flyers	Dave Smith	Skie@hotmail.com	Jones	Wendi	32	Norwich	ii.	Time Trial	22.5	120	04/07/2015	80,25	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Williams	Samantha	36	Norwich	ш	Time Trial	22.5	120	04/07/2015	6634	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Nudder	Annabelle	20	Norwich	íL	Time Trial	22.5	120	04/07/2015	69.05	0
Skie Flyers	Dave Smith	Skie@hotmail.com	Greenway	Theresa	19	Norwich	ıL	Time Trial	225	120	04/07/2015	72.15	0
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Pete	Hughes	22	Norwich	¥	Time Trial	22,5	120	04/07/2015	59.22	0
Peers Cyclers	Alicia Couper	Alicia@peers,bike	Wisley	Paul	22	Norwich	M	Time Trial	22.5	120	04/07/2015	120	10
Peers Cyclers	Alicía Couper	Alicia@peers.bike	Wooster	Bertrum	19	Norwich	Σ	Time Trial	22,5	120	04/07/2015	61.45	0
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Ahmed	Mohammed	20	Norwich	M	Time Trial	22.5	120	04/07/2015	63.57	D
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Nicolls	Karen	22	Norwich	щ	Time Trial	22.5	120	04/07/2015	58.45	0
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Anwar	Aneela	31	Norwich	ш	Time Trial	22.5	120	04/07/2015	67.5	0
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Anderson	Rosaland	19	Norwich	ш	Time Trial	22.5	120	04/07/2015	64.13	0
Peers Cyclers	Alicia Couper	Alicia@peers.bike	Akhtar	Yasmeen	20	Norwich	ш	Time Trial	22.5	120	04/07/2015	69.22	0
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Clive	Simms	56	Norwich	Σ	Time Trial	22.5	120	04/07/2015	120	10
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Adam	Craven	29	Norwich	Σ	Time Trial	22.5	120	04/07/2015	924	0
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Steve	Kingsley	18	Norwich	Σ	Time Trial	22.5	120	04/07/2015	62.8	D
Kings Cycle Club	Simon Jones	Simon@kingscycleciub,blke	Phil	Eddie	19	Norwich	Σ	Time Trial	22.5	120	04/07/2015	699	0
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Sally	Edwards	27	Norwich	ĹĽ	Time Trial	22.5	120	04/07/2015	72.5	0
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Eva	Shakarat	31	Norwich	ű.	Time Trial	22.5	120	04/07/2015	120	20
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Elena	Godfrey	8	Norwich	u	Time Trial	22.5	120	04/07/2015	59.3	0
Kings Cycle Club	Simon Jones	Simon@kingscycleclub.bike	Rochelle	Middleston	19	Norwich	Œ	Time Trial	22.5	120	04/07/2015	68.28	0
Norfolk Pedallars	Wendy Williams	Wendy@NorfolkPedallars.bike	Sean	Webster	31	Norwich	Σ	Time Trial	22.5	120	04/07/2015	83.45	0
Norfolk Pedallars	Wendy Williams	Wendy@NorfolkPedallars.bike	Dan	Platt	28	Norwich	Σ	Time Trial	22.5	120	04/07/2015	81.2	0
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallars.blke	Cain	Mitchell	22	Norwich	Σ	Time Trial	22,5	120	04/01/2015	71,56	D
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallars.bike	Dev	Patel	20	Norwich	M	TimeTrial	225	120	04/07/2015	89.65	Đ
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallarshike	Sally	Cropper	32	Norwich	iL.	TimeTrial	22.5	120	04/07/2015	120	01
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallars.bike	Charity	Winshaw	36	Norwich	ш	TimeTrial	22.5	120	04/07/2015	105.55	0
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallarsbike	Tracy	Carter	20	Norwich	ц	Time Trial	22.5	120	04/07/2015	69.45	0
Norfolk Pedallars	Wendy Williams	Wendy Williams Wendy@NorfolkPedallars.bike	Debbie	Grimshaw	18	Norwich	ш	Time Trial	22.5	120	04/07/2015	110.85	0

### **Set Task**

You must complete ALL activities within the set task.

Produce your documents using a computer.

Save your documents in your folder ready for submission using the formats and naming conventions indicated.

#### Activity 1: Entity relationship diagram

Produce an entity relationship diagram (ERD) for the database by normalising the given data to third normal form.

Save your entity relationship diagram in your folder for submission as **activity1erd:** 

- in your chosen software format and
- as a PDF.

You are advised to spend 1 hour and 10 minutes on this task.

Total for Activity 1 = 8 marks

#### Activity 2: Data dictionary

Produce a data dictionary for your database using the given document.

Duplicate the table, extend the box space and add extra rows to fit your answer as required.

Save your data dictionary in your folder for submission as activity2data:

- in your chosen software format and
- as a PDF.

You are advised to spend 1 hour on this activity.

Total for Activity 2 = 8 marks

### Activity 3: Design the user interface

Complete the 'Interface specification document'.

Ensure sufficient information is provided for a third party to implement the interface for your solution.

Extend the box space and add extra rows to fit your answer as required.

Save your completed 'Interface specification document' in your folder for submission as **activity3interface**:

- in your chosen software format and
- as a PDF.

You are advised to spend 1 hour and 45 minutes on this activity.

Total for Activity 3 = 6 marks

### **Activity 4: Testing plan**

Use the given 'Test Log and evaluation document' to plan how you will test your completed database.

Extend the box space adding extra rows to fit your answer as required.

Save your test plan and evaluation document in your folder for submission as **activity4test**:

- in your chosen software format and
- as a PDF.

You are advised to spend 1 hour on this activity.

Total for Activity 4 = 6 marks

#### Activity 5: Database development and testing

Develop and test your database using the information in the documents you produced for activities 1 to 4.

Record your database development as annotated screenshots in a single document.

Your screenshots should show:

- your tables, including the fields and attributes
- your table relationships
- your queries, including fields and criteria
- the output of your queries
- logging in as different users and the access levels provided
- the forms you have created
- the reports you have created
- evidence of working validation.

Record your testing including test results, comments and actions taken to resolve issues in the 'Test Log and evaluation document' you created and saved as **activity4test**.

Save your documents in your folder for submission as **activity5database** and **activity5testing**:

- in your chosen software format and
- as a PDF.

You are advised to spend 4 hours on this activity.

Total for Activity 5 = 26 marks

You need to evaluate your database solution recording this in the evaluation section of your organisation's Test log and evaluation document.

#### Activity 6: Evaluation of your database solution

Evaluate your solution.

You should consider:

- how well your solution meets the requirements of the scenario
- the quality, performance and usability of the database
- the changes made during the development and testing process.

Record your response in the evaluation section of the 'Test log and evaluation document' you created and saved as **activity5testing**.

Save your 'Test log and evaluation' in your folder for submission as activity6evaluation.

- in your chosen software format and
- o as a PDF.

You are advised to spend 1 hour on this task.

Your for Activity 0 = 12 marks

END OF TASK

TOTAL FOR TASK = 66 MARKS

Examples of the documents you need to complete.	
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Examples of the documents you need to complete.	

# Document for use with Activity 2 Data dictionary document

Table name		
Field name	Attributes	

# Document for use with Activity 3 Interface specification document

Name and type (form, query or report)	Fields used, including relevant details of data entry, calculations, presentation of data and navigation required.

valuation:	Your evaluation:			
valuation:	evaluation:			
valuation:	evaluation:			
evaluation:	svaluation:			
valuation:	valuation:			
			ion:	evaluat

### **General Marking Guidance**

- All learners must receive the same treatment. Examiners must mark the first earner
  in exactly the same way as they mark the last.
- Marking grids should be applied positively. Learners must be rewarded for what they
  have shown they can do rather than penalised for omissions.
- Examiners should mark according to the marking grid not according to the reperception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks if the learner's response is not rewardable according to the marking grid.
- Where judgment is required, a marking grid will provide the principles by which marks will be awarded.
- When exam ners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

# Specific Marking guidance

The marking grids have been designed to assess learner work holistically.

Rows within the grids identify the assessment focus/outcome being targeted. When using a marking grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely
  matches the learner response and place t within that band. Learners will be
  placed in the band that best describes the r answer.
- The mark awarded with n the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

Assessment focus	Band 0	Band 1	Band 2
Activity 1:	0	1-2	3-4
ERD	No rewardable material	ERD shows an attempt at normalisation with significant data redundancy.	ERD shows that r data is correctly normalised with r data redundancy.
	NO	ERD is partially complete with some correct relationships shown.	ERD is partially co with correct relat but the relationsh types are not clea
Activity 2:	0	1-2	3-4
Data Dictionary	material	Uses some meaningful field and table names with some inconsistencies.	Uses meaningful and table names minor inconsister
	No rewardable material	The data dictionary has limited use of correct data types.	The data dictiona correct data type: most fields.
	No rew	The data dictionary shows limited use of validation which may be inaccurate.	The data dictiona accurate validation for some of the fi
		The data dictionary identifies some primary and foreign key fields.	that require valid The data dictiona Identifies most pr and foreign key fi

	Band 3	Band 4	Max. mark
	5-6	7-8	8
nost	ERD shows that most data is correctly normalised with minimal data redundancy.  ERD is largely complete	The ERD shows that the data is correctly normalised with no data redundancy.	
omplete onships iip ar.	with mostly correct relationships and relationship types shown.	ERD is fully drawn with correct relationships and relationship types shown throughout.	
	5-6	7-8	8
field with cies. ry has	Uses a recognised naming convention is used with minor inconsistencies for fields and tables.	Uses a recognised naming convention is used consistently for fields and tables.	
s for ry has	The data dictionary has correct data types for most fields.	The data dictionary has correct data types for all fields.	
in rules elds ation. ry	The data dictionary has accurate validation rules for most of the fields that require validation.	The data dictionary has accurate validation rules for all fields that require validation.	
imary elds.	The data dictionary identifies all primary and most foreign key fields.	The data dictionary identifies all primary and foreign key fields.	

aterials.

Assessment focus	Band 0	Band 1	Band
Activity 3: Design	0	1-2	3-4
documentation	ble material	Interface design is limited, including some forms, queries and report required with some of the relevant fields	Interfac includin reports relevan
	No rewardable	Interface design has details of some criteria and calculations required which may include inaccuracies.	Interfaction details calculation Design
		Design is vague, making implementation of the interface by a third party difficult.	always to be in with mi

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2	Band 3	Max. mark
	5-6	6
e design is adequate, g most forms, queries and required with most of the t fields.	Interface design is thorough, including the full range of forms, queries and reports required with relevant fields.	
te design includes accurate of some criteria and ions required.	Interface design includes accurate details of criteria and calculations required.	
is informative but not clear, allowing the interface oplemented by a third party nor difficulties.	Design is clear and informative, allowing for the interface to be easily implemented by a third party.	

Assessm	ent focus	Ban d 0	Band 1	В
		0	1-2	
Testing	Activity 4:Test Plan	No rewardable material	Test plan is too narrow to confirm a working solution including limited normal, erroneous and/or extreme data.  Expected results are generic or mostly inaccurate based on identified test data.	Test properties to the confirmation of the con
		0	1-2	
	Activity 5:Testing	No rewardable material	Testing shows evidence of a limited or linear development process, with minimal identification and resolution of errors.  Comments show a limited understanding of errors that were found, and how they were fixed.	Testir iterati that is some may p  Comn under were were

and 2	Band 3	Max Marks
3-4	5-6	6
plan is adequate to m a working solution, ing some normal, eous and extreme data. ted results are and ate based on identified	Test plan is thorough, including a range of normal, erroneous and extreme data.  Expected results are specific and accurate based on identified test data.	
ata, but may lack detail.		6
3-4	5-6	0
ng shows evidence of an ve development process dentifies and resolves errors, but problems persist.	Testing shows evidence of an iterative development process that identifies and resolves errors and improves efficiency.	
nents show partial standing of errors that found, and how they fixed.	Comments show a clear and detailed understanding of errors that were found, and how they were fixed.	

aterials are the same of the s

Assessment focus	Band 0	Band 1	Band 2
Activity 5:	0	1-5	6 - 10
Database	No rewardable material	Database structure is logical only in parts with limited data integrity.  Object names are unclear making maintenance of the database by a third party difficult.  Database user interface is unclear or provides limited information and there are inconsistencies and inaccuracies in formatting so a user would experience difficulty in using the database.  The database uses minimal validation and checking procedures resulting in a system with limited capacity to reduce errors or handle unexpected events.  The database provides limited access control.  The database may not be fully functional and/or may have major errors that prevent the database from	Database has struct is mostly logical and enforces data integr some relationships.  Some object names clear allowing it to be maintained by a thir with minor difficulties.  Database user interclear but there are seinconsistencies and inaccuracies in form allowing a user to undatabase with minor difficulties.  The database uses seaccurate validation and checking procedures resulting in a system minimises the most errors and handles seun unexpected events.  The database provides appropriate access the defined user groups.  The database is fundand meets most of the criteria with minima.

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	Band 3	Band 4	Max. mark
	11-15	16 -20	20
ure that I ity for	Database has a logical structure that enforces data integrity for most relationships.	Database has a logical structure that fully enforces data integrity for relationships throughout.	
are e d party ss	Appropriate and clear object names are mostly used allowing it to be maintained by a third party.	Appropriate and clear object names are used throughout allowing it to be easily maintained by a third party.	
face is some atting se the	Database user interface is clear but there are some inconsistencies and inaccuracies in formatting allowing a user to use the database with minor difficulties.	Database user interface is clear and intuitive, consistently and accurately formatted allowing a user to easily use the database.  Database uses accurate	
some and s, n that common some	The database uses accurate validation and checking procedures, resulting in a system that minimises the majority of errors and handles most unexpected events.	validation and checking procedures throughout, resulting in a robust system that minimises errors and handles unexpected events.  The database provides appropriate access for defined user groups.	
les to some tional the given l errors.	The database provides appropriate access to most defined user groups.  The database is functional with minimal errors and meets the given criteria.	The database is fully functional and fully meets the given criteria.	

Assessment focus	Band 0	Band 1	Band 2
		Superficial understanding of relevant technical concepts shown with some inaccuracies.  Limited or unsupported justification of:  changes made during the development and testing process the relational database structure selected about the quality, performance and usability of the database Limited links between	4-6  Some accurate and releval understanding of technical concepts shown.  Some valid justification, which may lack support, of:  changes made during the development and testing process the relational database structure selected the quality, performant and usability of the database.  Some logical links betwee aspects of the solution and and usability of the database.
		aspects of the solution and the requirements of the scenario.  Technical vocabulary is used but it is not used appropriately to support arguments.	the requirements of the scenario but may lack clarity.  Mostly accurate technical vocabulary is used to support arguments.

	Band 3	Band 4	Max. mark
	7-9	10- 12	12
int I	Mostly accurate and detailed understanding of relevant technical concepts shown.  A valid and mostly supported justification of:  • changes made during the development and testing process • the relational database structure selected.  • quality, performance and usability of the database. Makes some logical coherent links between aspects of the solution and the requirements of the scenario.  Accurate technical vocabulary is used to support arguments.	Accurate and detailed understanding of relevant technical concepts shown throughout.  A valid and fully supported justification of:	
		used to support arguments.	

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